ABSTRACT OF THE DISCLOSURE

A hydraulic holder of a cutting tool or workpiece with a hydraulic circuit contained in a cartridge separate from the holder. The cartridge is fixedly inserted in an axial bore of the holder for clamping a tool or workpiece. The hydraulic cartridge comprising a first actuator access port in the toolholder; a second actuator access port in a cartridge shell; a cartridge body affixed fluid tight in the cartridge shell; the cartridge body having (i) a piston cylinder in axial alignment with the first actuator access port and the second actuator access port, (ii) a first annular positioning ring having the piston cylinder extending radially through the first annular positioning ring and at least one channel disposed longitudinally in the first annular positioning ring and in communication with the piston cylinder, (iii) an upper clamping band with a first end of the upper clamping band adjacent the first annular positioning ring and the upper clamping band surrounding a portion of an inner wall that is deformable, (iv) a second annular positioning ring adjacent a second end of the upper clamping band and having at least one clamping channel, and the second annular positioning ring surrounding a portion of the inner wall, (v) a lower clamping band with a first end of the lower clamping band adjacent the second annular positioning ring and the lower clamping band surrounding a portion of the inner wall that is deformable, (vi) a third annular positioning ring adjacent a second end of the lower clamping band and the third annular positioning ring surrounding a portion of the inner wall, (vii) the inner wall surrounding

and forming a tool inner bore, (viii) an actuator adjustable radially through the first annular positioning ring, a piston moveable by the actuator, and a seal moveable by the piston through a seal displacement range, the actuator, piston, and seal in axial alignment with one another in the piston cylinder so that the seal is proximate to the at least one channel, and (ix) hydraulic fluid filling the portion of the piston cylinder proximate the seal, the at least one channel, the upper clamping band, the at least one clamping channel, and the lower clamping band.

PARTS LIST

101.	V Flange Collar	328	Piston Cylinder Volume
102.	Shank	329	
103	Nosepiece	330	First Annular Positioning Ring
104.		331A&B	Coolant Passage
105	First Actuator Access Port	408	Radius
106	Bore	427	Flow/Bleed Channel Volume
107	Cartridge	529	Oil/Air Escape Through Hole
108	Cartridge Piston Bore	530	Piston Cap
109	Inner Bore	531	Hydraulic Circuit
201	Piston Cylinder	631	Seal Displacement Range
202	Prior Art Toolholder	704	
203	Holder	707	Deformable Outer Cartridge Shell
204	Actuator	732	Cylindrical End
205	Actuator Screw Thread	733	Insertion End
206	Inner Wall	833	Mandrel Cartridge
207	Neck	835	Mandrel Holder
208		901	Piston Engagement End
209	Cartridge Body	902	Flange
210	Cartridge Shell	903	Taper
211	Hydraulic Circuit	904	Seat
212	Toolholder Bore Wall	905	Seal Engagement Surface
213	Preset Adjustment Screw Thread	906	Piston Pin
214	Seal	907	Seal Compressor
215	Piston	908	Threaded Portion
308	Nose Piece Outside Wall	909	Head Cap
311	Upper Clamping Volume	910	Compression Taper
316A	Fill Channel	911	Engagement End Taper
316B	Bleed Channel	912	Shoulder
317A	First Clamping Channel	913	Contact End
317B	Second Clamping Channel	914	Insertion Tool
318A	Second Annular Positioning Ring	915	Insertion Tube
318B	Third Annular Positioning Ring	916	Shaft
319	Lower Clamping Band	917	Bore
320	Upper Clamping Band	918	Through Pipe
321	Cylindrical End Bore	919	First Diameter
322	Second Actuator Access Port	920	Second Diameter
323	Lower Clamping Volume	921	Mandrel Cartridge First End
324	First Clamping Channel Volume		
325	Second Clamping Channel Volume		
326	Fill Channel Volume		
327	Bleed Channel Volume		

GP:1493669 v1